AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application:

Listing of Claims:

1. (currently amended) An *in vitro* serological assay method for [[diagnosing]] detecting and quantifying the presence of microbial agents by immunodetection, wherein the presence is detected and the quantity of patient immunoglobulins is assayed of both classes M and G, or only class G, specific to a microbial antigen characteristic of said microbial agent, in a patient's serum sample to be tested, by detection of an immunological reaction complex between said microbial antigen to be detected and a said specific class M immunoglobulin for IgM assay and/or respectively a said specific class G immunoglobulin for IgG assay, using a first detection substance and/or respectively a second detection substance comprising an antibody only reacting with a said immunoglobulin of the patient species of class M and/or respectively G, characterized in that the method comprises:

1/ carrying out the preliminary control steps in which:

said serum sample to be tested and said first and second detection substances, or only said second detection substance, are contacted with at least one solid support on which the following antigens have been attached:

a first control antigen consisting of a non-specific class G immunoglobulin of the patient species, and

a second control antigen containing DNA/histone complexes,

[[optionally,]] a third control antigen consisting of a non-specific class M immunoglobulin of the patient species, the presence of said third control antigen being necessary in the event of IgM assay, and

at least one said microbial antigen, and

a series of controls is conducted comprising:

a- controlling the reactivity of said second detection substance by verifying whether said first control antigen reacts with said second detection substance, and optionally control of the presence of rheumatoid factors in said serum sample by verifying whether the first control antigen reacts with said serum sample and said first detection substance, in the event of IgM assay,

b- controlling the presence of anti-nuclear antibodies in said serum sample to be tested by verifying whether said second control antigen reacts with said serum sample and second detection substance,

c- controlling the reactivity of said first detection substance by verifying whether said third control antigen reacts with said first detection substance, in the event of IgM assay, and

d- controlling the presence of a human serum in the sample to be [[tested,]] tested by detecting whether immunoglobulins of the patient species react with a fourth control antigen containing protein A of a *Staphylococcus aureus* bacterium; and

2/ A reaction result between said microbial antigen, said serum sample and a said first and/or second detection substance is only taken into account if the control of the presence of a human serum is positive and if the following accumulative conditions are met:

a- said first control antigen reacts with said second detection substance,

b- said second control antigen does not react, and

c- when applicable, said third control antigen reacts with said first detection substance, in the event of IgM assay.

2. (currently amended) [A] The method as in claim 1, characterized in that a single solid support is used, contacted simultaneously with said first and second detection substances containing a first and respectively a second labelling element, the second labelling element emitting a different signal to the first labelling element, said first and second detection substances containing a first and respectively a second antibody only reacting with a said immunoglobulin of the patient species of class M and respectively class G.

3. (currently amended) [A] The method as in claim 1, characterized in that, in step 1(d), it is controlled that said tested sample does contain a serum of the patient species by detecting whether immunoglobulins of the patient species react with a fourth control antigen containing protein A of a *Staphylococcus aureus* bacterium, [preferably] said fourth antigen being a whole *Staphylococcus* bacterium, by contacting said sample in the presence of said second detection substance with a solid support on which a said fourth control antigen is attached; [[in the presence of]] said second detection substance [[which is]] being an anti-immunoglobulin antibody of the patient species not reacting with said fourth control antigen, the control of the presence of a serum being positive

if said fourth antigen reacts with said serum sample and said second detection substance.

4. (currently amended) [A] The method as in claim 1, characterized in that said second detection substance is an animal immunoglobulin.

5. (currently amended) [A] The method as in claim 1, characterized in that the two said first and second detection substances are goat or chicken immunoglobulins, respectively anti-IgM and anti-IgG.

6. (currently amended) [A] The method as in claim 1, characterized in that said second control antigen consists of non-confluent human fibroblast cells in suspension.

7. (currently amended) [A] The method as in claim 1, characterized in that said control antigens and microbial antigens are attached to the solid support by physical adsorption.

8. (currently amended) [A] The method as in claim 1, characterized in that said microbial antigen is a corpuscular antigen consisting of a whole inactivated microbe or microbe fraction.

9. (currently amended) [A] The method as in claim 1, characterized in that said microbial agent is chosen from among the micro-organisms comprising a bacterium, a virus, a parasite or a fungus.

10. (currently amended) [A] The method as in claim 9, characterized in that said microbial antigen is an intracellular bacterium or a virus.

11. (currently amended) [A] The method as in claim 9, characterized in that said microbial antigen is [[chosen from among the]] from a bacteria of a genus selected from the group consisting of *Rickettsia, Coxiella, Bartonella, Tropheryma, Ehrlichia, Chlamydia, Mycoplasma, Treponema, Borrelia* and *Leptospira*.

12. (currently amended) [A] The method as in claim 11, characterized in that said microbial antigen is a bacterium responsible for endocarditis.

13. (withdrawn) The method as in claim 10, characterized in that said microbial antigen is a viral antigen chosen from among the viruses H.I.V, C.M.V., Epstein-Barr, Measles, Rubella, Hepatitis A and B.

14. (currently amended) [A] The method as in claim 3, characterized in that:

- the detection, and the assay is performed of the quantity of patient immunoglobulins of both classes M and G specific to a microbial antigen,
- at least one said microbial antigen and said first, second and third and fourth control antigens are attached to one same solid support, and
- for the detection of the different said microbial antigens, the same said first and second detection substances are used with different labelling elements, said first and

second detection substances being animal immunoglobulins not reacting with said fourth antigen.

15. (currently amended) [A] The method as in claim 1, characterized in that as solid support a glass or plastic slide is used, or a titre tube or well of a plastic microtitre plate.

16. (currently amended) [A] The method as in claim 1, characterized in that in the sample to be tested the detection and the assay of said immunoglobulin of the patient species specific to said microbial antigen is performed, and the immunological reactions between said control antigens and said detection substances are read by automated reading using equipment for reading a fluorescent signal of a fluorescent substance corresponding to the labelling elements of said detection substances.

17. (currently amended) [A] The method as in claim 1, characterized in that said microbial antigen is a vaccine antigen and said immunoglobulin specific to said microbial [[vaccine]] agent to be detected is a class G immunoglobulin.

18. (currently amended) [A] The method as in claim 17, characterized in that the vaccine status of a person is determined by detection of IgG serum antibodies specific to the vaccine antigens of a plurality of pathogenic agents of bacterial, viral, fungal or parasitic type, by detecting an immunological reaction complex between each said vaccine antigen and respectively each said antibody specific to said vaccine antigen, which may be present in a human serum sample to be tested, comprising:

1. Contacting one single, same said serum sample to be tested with:

- one same solid support on which a plurality of said vaccine antigens is attached, and said first and second control antigens,

- in the presence of at least one said second detection substance reacting with at least one said specific antibody and not reacting with any of said vaccine antigens, and

2. Performing at least one said control of the reactivity of said second detection substance using a said first control antigen, and one said control of the presence of anti-nuclear antibodies using at least one said second control antigen, and controlling the presence of human serum in said sample to be tested.

19. (currently amended) [A] The method as in claim 18, characterized in that said specific antibodies of IgG immunoglobulin type are detected and a said second detection substance is used which is an anti-IgG immunoglobulin, consisting of a goat or chicken immunoglobulin.

20. (currently amended) [A] The method as in claim 18, characterized in that said vaccine antigens are antigens of pathogenic agents [[chosen from among the]] selected from the group consisting of viruses of mumps, rubella, measles, chicken pox, poliomyelitis, yellow fever, tick-borne encephalitis, hepatitis A, hepatitis B and the bacteria of *Bordetella pertussis*, tetanus and diphtheria.

21. (currently amended) [A] The method as in claim 18, characterized in that it is determined whether the concentration of said specific antibodies reaches a [[cut-off]] value on and after which said specific antibody has a protective action protecting against the disease determined by the pathogen.

22. (currently amended) [A] The method as in claim 18, characterized in that a determined volume of whole blood is collected using a capillary tube in a flask containing a determined volume of buffer allowing elution of the serum, the serum then preferably being diluted to a determined concentration, preferably 1:100 to 1:20.

23. (currently amended) [A] The method as in claim 18, characterized in that quantification of a said vaccine antigen is carried out in quantifying an immunological reaction complex between said vaccine antigen and said antibody specific to said vaccine antigen, and the following measurements are made:

1- a first measurement of a first value representing the quantity of a first labelling element, said first value being the intensity value of a signal emitted by said first fluorescent labelling element, said first labelling element binding itself non specifically to any protein in the depositing area of said vaccine antigen, and

2- a second measurement of a second value representing the quantity of a second labelling element emitting a different signal to said first labelling element, said second value being the intensity value of the signal emitted by this second fluorescent labelling element at a different excitation wavelength to that of said first fluorescent labelling

element, said second labelling element being the labelling element of said second detection substance for said vaccine antigen in the depositing area of said antigen, and

3- the ratio between said first and second values is calculated, and

4 - the value of said ratio is compared with the value of a reference ratio obtained with a collection of positive and negative reference sera, thereby making it possible to determine, by comparison, whether or not it is necessary to vaccinate the person against said vaccine antigen in relation to the ratio between said first and second values.

24. (previously presented) The diagnostic kit which can be used for implementing a method as in claim 3, characterized in that it contains:

- at least one said solid support on which at least one said microbial antigen and said control antigen(s) are attached, said control antigens containing at least said first and second control antigens and optionally said third and fourth control antigens, and
- said detection substance(s).

25. (currently amended) [A] <u>The</u> kit as in claim 24, characterized in that it contains:

- one same said solid support on which at least one said corpuscular antigen and said control antigens are attached by physical adsorption, and
- at least one of a same said first or second detection substance to detect the different microbial antigens.

26. (currently amended) [A] The kit as in claim 24, characterized in that it comprises a flask containing a determined volume of elution buffer to collect a determined volume of serum sample to be tested.

27. (currently amended) [A] The method for preparing a kit as claimed in claim 23 comprising a solid support on which at least one antigen is attached chosen from among a said microbial agent, preferably corpuscular, a said first, a said second, optionally a said third a said fourth control antigen enabling detection by automated reading using a said first and optionally said second detection substance, characterized in that said microbial antigens, and control antigens are deposited by robot arrayer, said corpuscular antigens being associated with a fluorescent dye in the form of a suspension at a concentration enabling their visualization with said dye after being deposited, thereby making it possible to verify the attachment of said antigens to said solid support.

28. (currently amended) [A] The method as in claim 27, characterized in that a robot arrayer is used to deposit a said microbial antigen and a said second control antigen and a said fourth control antigen in the form of a suspension of non-confluent cell corpuscles, whole viruses or whole bacteria, or fractions of cells or bacteria.

29. (currently amended) [A] The method as in claim 28, characterized in that the control antigens in the form of a cell suspension are calibrated at a concentration of 10^7 to 10^9 cells/ml, said control antigens or microbial antigens in the form of suspensions of bacteria or bacteria fractions are calibrated at a concentration of 10^7 to 10^9 particles/ml, and

the suspensions of whole viruses at a concentration of 10^9 to 10^{10} particles/ml.

30. (currently amended) [A] The method as in claim 28, characterized in that said control antigens and corpuscular microbial antigens are deposited in a mixture with a protein binder to stabilize attachment to said solid support.

31. (currently amended) [A] The method as in claim 30, characterized in that said protein binder is chosen from among egg yolk, gelatine, bovine serum albumin or a non-human polyclonal IgG.

32. (currently amended) [A] The method as in claim 31, characterized in that said corpuscular microbial antigen is deposited on said solid support consisting of a glass slide, in a mixture with an immunoglobulin of goat polyclonal IgG type.

33. (currently amended) [A] The method as in claim 27, characterized in that prior washing of said solid support is performed with a solution of an ethanol/acetone mixture, preferably 50-50, then the said antigens are deposited and their attachment stabilized by physical adsorption on said solid support by treatment with alcohol, methanol or ethanol, which alcohol is subsequently removed, further the attachment of said antigens is verified by staining, with labelling non-specific to the proteins or DNA.

34. (currently amended) [A] The method as in claim 27, characterized in that the attachment by physical adsorption of said control antigens and microbial antigens is completed by

cross-linking treatment, preferably a chemical treatment using a bi-functional agent for covalent coupling.

35. (new) The method as in claim 1, wherein, in step 1, said serum sample to be tested and said first and second detection substances, or only said second detection substance, are contacted with one same solid support.